

What is claimed is:

1. Semiconductor nanoparticles having fluorescence properties and comprising a modifying group represented by the following general formula bound to their surfaces:

-OY

wherein Y is selected from a hydrogen atom, a metal atom, a semimetal atom, an organic group, or an organic group that is intermediated by a metal atom or a semimetal atom.

2. The semiconductor nanoparticles according to claim 1 wherein the modifying group is an -OH group.

3. The semiconductor nanoparticles according to claim 1 wherein the material for the core of the semiconductor nanoparticles is selected from ZnO, ZnS, ZnSe, ZnTe, CdO, CdS, CdSe, CdTe, HgS, HgSe, HgTe, InP, InAs, GaN, GaP, GaAs, TiO₂, WO₃, PbS, and PbSe.

4. The semiconductor nanoparticles according to claim 1 wherein the particle sizes of the semiconductor nanoparticles are monodispersed with deviations of less than 10% rms in diameter.

5. The semiconductor nanoparticles according to claim 1 wherein the semiconductor nanoparticles emit fluorescence in a narrow spectrum range of 60 nm or less in terms of the full width at half maximum (FWHM) upon the application of excitation light.

6. A method for producing the semiconductor nanoparticles according to claims 1 wherein a compound having a hydroxyl group is allowed to react with the surfaces of the semiconductor nanoparticles for stabilization.

7. A method for producing the semiconductor nanoparticles according to claims 6 wherein the semiconductor nanoparticles are placed in an alkaline environment.

8. A method for producing the semiconductor nanoparticles according to claims 6 wherein the semiconductor nanoparticles are allowed to react with an active hydrogen-containing compound in an alkaline environment.

9. The method for producing semiconductor nanoparticles according to claim 7 wherein the alkaline environment is between pH 9 and pH 11.

10. The method for producing the semiconductor nanoparticles according to claims 6 wherein the semiconductor nanoparticles are subjected to surface modification and purification.

11. The method for producing semiconductor nanoparticles according to claim 10 wherein the surface modification is carried out using a thiol compound.

12. The method for producing semiconductor nanoparticles according to claim 10 wherein the number of the layers of atoms equivalent to an oxide film is at least 0 in the surface modification of the semiconductor nanoparticles.

13. A fluorescence reagent comprising the semiconductor nanoparticles according to claim 1.